

## Urban Planning: The Urgent Needs to Redevelop Ex-Landfill Sites as Public Parks in Malaysia

### Perancangan Bandar: Keperluan Mendesak Terhadap Pembangunan Semula Tapak Bekas Tapak Pelupusan Sebagai Taman Awam di Malaysia

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#### ABSTRACT

*As the center of human habitation, the city's growing in tandem with the increase of urban population and urban sprawl's. The increase in urban population has created a variety of effects on space and environment. The urban space limitations urged people especially urban society to utilize their existing space as best as possible and looking at the potential to reused the contaminated natural resources. In the other hand, the urban sprawl has sparked a conflict between the settlement and the brownfill area; especially the ex-landfill site. The existence of 147 ex-landfill sites in the vicinity of urban settlement requires an action to restructuring of the urban planning in Malaysia. Ex-landfill sites which is synonymous with the negative impact on the environment and public perception must be redevelop immediately. Development needs of the ex-landfill site in the context of development in Malaysia are articulated in the National Urban Policy and the National Landscape Policy. Redevelopment of the ex-landfill is not only said to be able to mitigate with the environment problems, but also could improve the number of urban spaces and the urban economy. Hence, this paper argues the need for ex-landfill sites to be redeveloped as a public park or open spaces. Therefore, the planning standard of 2 hectares of open spaces per 1,000 urban populations could be achieved. The argument on the needs of redevelopment ex-landfill site as open space or Public Park will also be supported with literature data and field studies that show the effect of increasing well-being of the urban society based as the impact of the redevelopment of ex-landfill site as public park.*

**Keywords:** Urban planning; ex-landfill sites; public parks; Malaysia

#### ABSTRAK

*Sebagai tempat kehidupan manusia, peningkatan perbandaran semakin meningkat seiring dengan peningkatan jumlah penduduk bandar. Peningkatan penduduk bandar telah mewujudkan pelbagai kesan pada ruang dan persekitaran. Batasan ruang bandar menggesa rakyat terutama masyarakat bandar untuk menggunakan ruang yang ada dengan sebaik mungkin dan melihat potensi untuk digunakan semula sumber semula jadi yang tercemar. Di satu sudut pandang lain, di kawasan bandar telah mencetuskan konflik antara penyelesaian dan kawasan 'brownfill' itu; terutama tapak bekas pelupusan sampah. Kewujudan 147 bekas tapak pelupusan sampah di sekitar penempatan bandar memerlukan tindakan untuk menyusun semula perancangan bandar di Malaysia. Bekas tapak pelupusan sangat sinonim dengan persepsi masyarakat yang melihat ianya membawa kesan negatif terhadap alam sekitar perlu diubah dengan kadar segera. Keperluan pembangunan tapak bekas tapak pelupusan dalam konteks pembangunan di Malaysia dinyatakan dalam Dasar Perbandaran Negara dan Dasar Landskap Negara. Pembangunan semula bekas tapak pelupusan bukan sahaja dikatakan dapat mengurangkan masalah alam sekitar; tetapi juga boleh meningkatkan jumlah ruang bandar dan ekonomi bandar. Oleh itu, kertas ini berpendapat perlunya tapak bekas tapak pelupusan untuk dibangunkan semula sebagai taman awam atau di tempat terbuka. Oleh itu, standard perancangan 2 hektar kawasan lapang bagi setiap 1,000 penduduk bandar dapat dicapai. Hujah kepada keperluan pembangunan semula tapak bekas tapak pelupusan kawasan lapang atau taman awam juga akan disokong dengan data literature dan bidang kajian yang menunjukkan kesan peningkatan kesejahteraan masyarakat bandar berasaskan sebagai kesan pembangunan semula bekas tapak pelupusan sebagai taman awam.*

**Kata kunci:** Perancangan bandar; tapak bekas tapak pelupusan; taman-taman awam; Malaysia

#### INTRODUCTION

The need and the importance of developing livable, cheerful, compact and people-oriented is the goal for urban planning in Malaysia. However, the growth

of the urban population has been identified to be hindrance to that goal. Urban population growth is not only causing problems of urban sprawl, lack of public space in urban areas and creates high demands to the existing natural resources but also

urged the need to develop brownfield area mainly the ex-landfill sites which located within the vicinity urban area as a new redevelopment.

#### URBAN DEVELOPMENT AND URBAN SOCIETY'S WELL-BEING

Urbanization creates urban areas. City is often described as the most suitable habitat for humans to acquire a good quality of life because of the diversity urban infrastructure existence to be a prerequisite for progress and prosperity of a country (Sham Sani 1982). Therefore, UN-HABITAT (2011) sets out the requirement for city administrator to provide good urban infrastructure as the criteria to achieve 'liveable' city status, as shown in Figure 1. Green infrastructure which defines as a network of open spaces, green areas, parks, wetlands, natural habitats and areas of natural landscape for the purpose of ecosystem preservation (National Landscape Department 2012) also identified the urban infrastructure needed in creating liveable city.

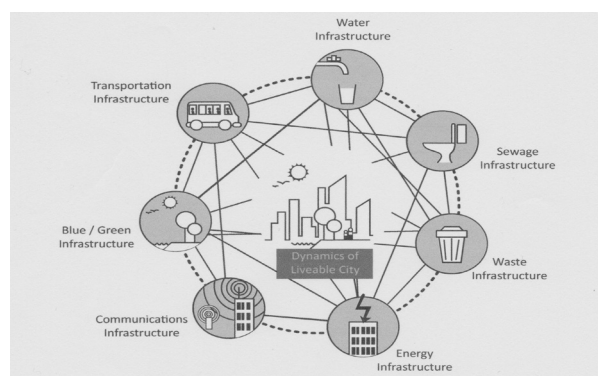


FIGURE 1. Liveable city's infrastructure  
Source: UN-HABITAT 2012

The ability of city's administrator to provide a comprehensive liveable city's infrastructure always indicated as the indicator to the good quality of life to the urban society. Quality of life which is generally refers to human wellbeing is the inclusion of subjective and objective aspects based on individual owns experience and satisfaction. Although there are different definitions and views on aspects of quality of life (Lim et al. 1999; Raphael et al. 2001 & Azahan Awang and Kadir Arifin 2008), but the view Burc et al. (2001) used as a basis of reference for the urban society's quality of life. Urban society's quality of life resulting from the

inclusion of a good four key indicators of urban environments which are the physical environment, economic environment, social environment, and transport and communication environment (Figure 2). According to Burc, the existence of these four urban environments will create sustainable urban development that could bring positive impact to the well-being of urban society. These view is consistent with the opinion of Yusuhiko (2006), which states that urban development and well-being of urban society functional in circular causation which act as mirror effect to human civilization and progress.

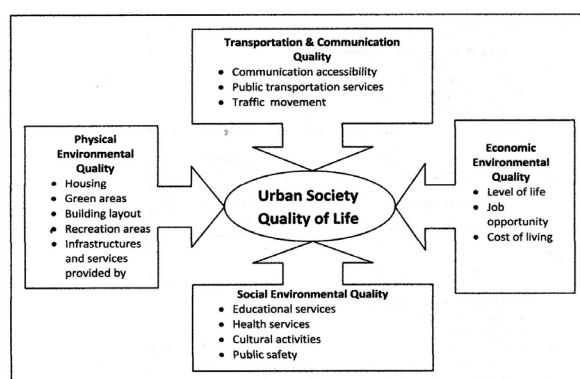


FIGURE 2. Indicators of urban society quality of life  
Source: Adapted from Burc et al. (2001)

#### PUBLIC PARKS AND ITS RELATION TO THE URBAN SOCIETY'S WELL-BEING

As early as the 19th century, when Frederick Law Olmsted (known as the father of Landscape Architect) developed Central Park as the first public park in the world, he believed on the unconscious processes produced by public parks in providing peace and reduce stress to the people living in saturated urban built environment (Lewis 1992). Frederick Law Olmsted belief is further supported by evidence proved by Rachel and Stephen Kaplan (1989) through Attention Restorative Theory (ART). This theory states that the human relationship with nature, whether by spending time in the natural environment or just view the scenic beauty of nature will enhance the ability of concentration and could treat mental fatigue.

ART theory has been tested and verified its authenticity by many other researchers, including Nettleton (1992), Ulrich (1999), Kuo (2001) and Taylor (2001). The perception's study on the function of public parks by Nettleton proves that

public park is considered by the urban society as a public area that brings out the feelings of serenity, peace and positive mood. Ulrich also prove that the natural environment in the public park is able to respond to the 'parasympathic nervous system' in the human body that contributes to faster healing results and able to improve human health. Kuo's study proved that the residents of a residential area surrounded by green environment has a higher concentration, open-minded and have a higher level of positive response as compared to the population in residential areas without green environment. The crime rate in a residential area with green environment was also lower. Meanwhile, Taylor's study proved that green environments had a positive impact on children who suffer from ADD symptoms. Green environment act as a cure components that aid ADD symptoms, with assumption of the 'greener' the play area, the less ADD symptoms faced by these children. Those studies clearly become the justification on the fact that public park could bring benefits to public health and well-being of human life. Even Cecily (2009) emphatically stated that

public park has the potential to reduce the burden of financial on the provision of health system borne by the government and should be used as components of urban infrastructure.

#### PROBLEMS, POTENTIAL AND NEEDS TO REDEVELOP EX-LANDFILL AREA

##### PROBLEMS AND POTENTIAL OF EX-LANDFILL AREA

Rapid urban development processes that create the effects of urban sprawl has caused the landfill sites that formerly located outside the urban boundaries and the major urban settlements area become part of urban settlement and city's image. A study conducted by the Japan International Cooperation Agency (JICA) and the Ministry of Housing and Local Government in 2003 has identified 147 ex-landfill sites throughout Malaysia with total areas of 507.8 hectares (Table 1) and located near or within urban settlements (Ministry of Housing and Local Government 2004).

TABLE 1. Landfill sites in Malaysia

State	Number of landfill site	Status (type and category)	Area (hectare)
Selangor	12	Type: Open site (4), Level 1 (4), Level 3 (1), Level 4 (1) Category: Close (11), Operation (1)	178.2
Kuala Lumpur	7	Type: Open site (1), Level 1 (2), Level 2 (4) Category: Close (7)	80.0
Negeri Sembilan	13	Type: Open site (10), Level 1 (3) Category: Close (10), Operation (3)	93.8
Melaka	8	Type: Open site (6), Level 1 (1), Level 2 (1) Category: Close (7), Operation (1)	44.5
Johor	27	Type: Open site (24), Level 1 (2), Level 2 (1) Category: Close (20), Operation (7)	213.8
Pahang	18	Type: Open site (7), Level 1 (4), Level 2 (4), Level 3 (3) Category: Close (18)	226.2
Terengganu	10	Type: Open site (10) Category: Close (7), Operation (3)	60.2
Kelantan	13	Type: Open site (11), Level 1 (1), Level 2 (1) Category: Close (8), Operation (5)	68.8
Perak	26	Type: Open site (20), Level 1 (5), Level 2 (1) Category: Close (18), Operation (8)	260.3
Pulau Pinang	3	Type: Level 1 (1), Level 3 (2) Category: Close (2), Operation (1)	101.0
Kedah	9	Type: Open site (4), Level 1 (2), Level 2 (2), Level 3 (1) Category: Close (6), Operation (3)	173.0
Perlis	1	Type: Level 2 (1) Category: Close (1)	8.0

Source: Adapted from Ministry of Housing and Local Government (2004), National Landscape Department (2010) and site survey 2013

Ex-landfill that is also known as brownfield (Yu 2012) and disturbed land (George 1991) is stated to give prolong negative impact to human life and environment. This is due to the fact that even the landfill has been closed or stopped its operation but it still issuing leachate and landfill gas and in unstable soil condition until the decomposing processes is fully completed, which may take a period more than 20 years (Ministry of Housing and Local Government 2004; Atiyat 2005; National Landscape Department 2010 and United States of Environmental Protection Agency 2010). However, despite the anxiety and concern over the negative impact to the environment and human health, ex-landfill sites is seen as a renewable resource and alternative in dealing with the problem of lacking public spaces in the urban spaces that able to bring out the socio-economic improvement to the urban area and society (Japan Institute of City Environmental Issue 2006; Yusuhiko 2006; National Landscape Department 2010 and Mindaugus et al. 2012).

become a constraint. Providing adequate urban open spaces based on urban planning standard of 2 hectares open space per 1000 urban population in Malaysia (National Landscape Department 2012) is difficult to implement. Existing open space in urban areas compared to urban population would cause Kuala Lumpur city provide 8 square meters of open space per urban population in the year 2020 (PEMANDU 2010). Efforts to address these constraints create the need for humans to create new functions and develop the natural resources that have been abandoned and polluted such as ex-landfills areas for the benefits of human and environment (Japan Institute of City Environmental Issue 2006; Yusuhiko 2006; National Landscape Department 2010 and Mindaugus et al. 2012). Therefore, in the context of Malaysia physical development, the needs of ex-landfill as a new function specifically stated in the National Urban Policy, National Landscape Policy and 'Guideline for the safe closure and rehabilitation of Municipal solid waste landfill sites'.

#### THE NEED FOR EX-LANDFILL REDEVELOPMENT

Increase of urban population led to an increasing need for natural resources and urban space (UN-HABITAT 2010). However with the limitations of the urban area and the increasing of physical urban development, providing adequate space for the provision of urban public facilities and urban green infrastructure

#### NATIONAL URBAN POLICY

As a policy that drive towards achieving the goal of 'creating visionary city through sustainable urban development', National Urban Policy has specifically stated the need to redevelop the brownfield area and providing the sufficient open area in the urban area (Table 2).

TABLE 2. NUP6 and NUP9 Action Plan, National Urban Policy

Policy	Steps
NUP6 Urban development should give priority to the development of the urban area	<ol style="list-style-type: none"> <li>1. Implement infill potential areas</li> <li>2. Identify brownfield areas</li> <li>3. Planning and preparing programs for brownfield redevelopment</li> <li>4. Urban regeneration through generating potential area</li> <li>5. Rehabilitation of contaminated land prior to development</li> </ol>
NUP9 Open space and recreation areas shall be adequately provided according to the population needs	<ol style="list-style-type: none"> <li>1. Recreational areas are provided in accordance with the hierarchy and guidelines standards.</li> <li>2. Provide adequate public open spaces through the adoption of indicator 2 hectares: 1000 urban population</li> <li>3. Ensure open space and equipped with various recreational sports facilities according to the needs and demands of the population.</li> <li>4. Gazette the recreational areas and monitor the implementation of its development.</li> <li>5. Encourage the development of integrated green linkages in urban area.</li> <li>6. Adopt the National Landscape Policy in the preparation of landscape development.</li> </ol>

Source: Town and Country Planning Department (2000)

The association of brownfield redevelopment needs with the provision of open further detailed in the Planning Guidelines for Identification of Brownfield Redevelopment Area (National Landscape Department 2012) which states the need to redevelop brownfield area in accordance with the specific category, where redevelopment as a recreational area or public parks is proposed for the ex-landfills.

#### NATIONAL LANDSCAPE POLICY

As a policy that sees landscape as an effective effort to address environmental problems, the National Landscape Policy explained the need to improve the potential of disturbed areas through landscape rehabilitation. Therefore, the ex-landfill identified should be conserve and redevelop in accordance with the strategy 4.6 (Table 3).

TABLE 3. Strategy 4.6, National Landscape Policy

Actions Plan	
4.6.1	Ensure the rehabilitation and conservation of disturbed land for the purpose of recreation and reforestation.
4.6.2	Enhancement of biodiversity by using indigenous plant in the conservation of disturbed land.

Source: National Landscape Department (2012)

#### ‘GUIDELINE FOR SAFE CLOSURE AND REHABILITATION OF MUNICIPAL SOLID WASTE LANDFILL SITES’

‘Guideline for safe closure and rehabilitation of Municipal solid waste landfill sites’ suggested that the redevelopment of ex-landfill areas should complies with stability parameters (Table 4) and

limited development types in order to protect the welfare of the society and environment (Ministry of Housing and Local Government 2004). Only five types of redevelopment is allowed to be implemented at the ex-landfill sites, which were agricultural areas, public park, parking areas and roads, low-rise residential area and business or industry area.

TABLE 4. Ex-landfill stability parameter

Parameter	Value Target
Leachate	Follow the standards set by the Department of Environment, either A or B (depends on the location of the ex-landfill sites). Specific assessments to BOD, COD, SS and heavy metals.
Gas	Methane gas below 1.0% Oxygen gas above 18.0%
Soil subsidence rate	Less than 2cm per year

Source: Adapted from Ministry of Housing and Local Government 2004

#### THE NEEDS TO REDEVELOP EX-LANDFILL AS PUBLIC PARK

This paper sees the needs to redevelop ex-landfill as a public park base on two aspects, namely the Government of Malaysia’s decision that being interpreted in form of policy and guidelines, as well as the redevelopment requirements needs from the Malaysian society perception’s.

#### POLICY AND GUIDELINES RELATED TO THE REDEVELOPMENT OF EX-LANDFILL SITE AS A PUBLIC PARK

The policy that stated the need to redevelop the ex-landfill as public park in the context of physical planning in Malaysia is anchored by the decision of the National Physical Planning Council. As the main government council in determine the direction of physical planning in Malaysia, National Physical Planning Council decided that public parks should be the priority type for ex-landfill redevelopment (National Physical Planning Council 2004). Thus

by adherence to the policy, it is expected by the year 2020, the ex-landfill redevelopment in urban areas will result in the existence of 45 new public parks which consists of 2 numbers of City Park, 11 numbers of Local Park, 18 numbers of neighborhood field, 9 numbers of play fields and 5 numbers of playground lots.

The redevelopment of the ex-landfill as public parks also being highlights in the *Panduan Pemuliharaan Bekas Tapak Pelupusan Sisa Pepejal*

*Sebagai Taman Awam* (National Landscape Department 2010) and *Garis Panduan Perancangan Pengenalpastian Bagi Pembangunan Semula Kawasan Brownfield* (Town and Country Planning Department 2012). Both the guidelines specifically state the needs to redevelop ex-landfills as public parks. The National Landscape Department also recommended that the redevelopment of ex-landfill sites as public parks should following the criteria as set out in table 5.

TABLE 5. Redevelopment criteria to redevelop ex-landfill as public park

Criteria	Development requirement's
Ex-landfill types	Ex-landfill with safe closure Level 4
Size of area	Comply with the standard size of open area
Location and accessibility	Comply with the public park's location and accessibility
Sites suitability	Comply with Ex-landfill Stability Parameter
Topography and visual factor	Focal points and visual views should be emphasis in the design planning stages.
History	Identify the history of land-use before landfill development taking place to determine the soil stability and subsidence rate.
Socio-economic	Redevelopment should give effect to human well-being and improve economic value to the surrounding area.

Source: Adapted from National Landscape Department (2010)

#### THE NEEDS OF MALAYSIAN SOCIETY TO THE REDEVELOPMENT OF EX-LANDFILL AS PUBLIC PARKS

A preliminary study to determine the perceptions of Malaysian society to the proposed redevelopment of the ex-landfill as public parks have been implemented in the month of July 2013. A total of 100 individual were randomly selected as the respondent. Respondents were comprised of residents around the 1.0 kilometer radius of the Jinjang Utara ex-landfill area (ex-landfills that have not been redevelop), Worldwide Recreation Parks Recreation (public park developed in the ex-landfill sites) and the experts group in the field of landscape architecture, urban planning and environment.

The findings are as follows:

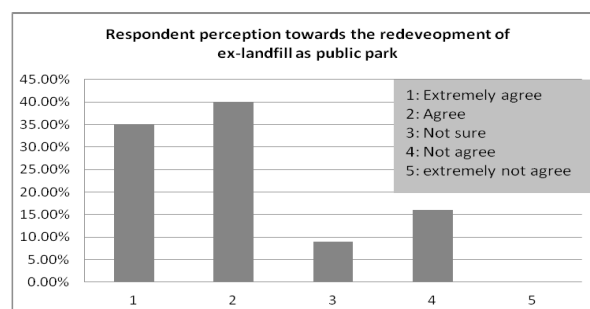


CHART 1. Respondent perceptions towards the redevelopment of ex-landfill sites as a public park

#### IMPACT OF EX-LANDFILL REDEVELOPMENT AS PUBLIC PARK

The study perception shows that the perception of residents surrounding the area of 1.0 kilometer radius from the Worldwide Recreation Park has a positive view on the aspect of well-being that arises due to the impact of the redevelopment of ex-landfill as public park (Table 6).

TABLE 6. Community perceptions towards well-being

Question related to the respondents perception's on well-being aspect	Percentage of perception				
	Extremely agree	Agree	Not sure	Not agree	Extremely not agree
Are you satisfied with your resident's surrounding environment?	0.00%	60.00%	20.00%	20.00%	0.00%
Are you satisfied with the beauty surrounding your resident's environment?	0.00%	46.66%	13.33%	40.00%	0.00%
Are you satisfied with the level of public security within your surrounding resident's environment?	6.66%	40.00%	6.66%	40.00%	6.66%
Are you satisfied with the air quality surrounding your resident's environment?	6.66%	40.00%	6.66%	40.00%	6.66%
Are you satisfied with the level of comfort surrounding your resident's environment?	0.00%	53.33%	20.00%	20.00%	6.66%

## CONCLUSION

Malaysia's aim to develop a sustainable city which is liveable, lively, concise and people-oriented should be fully supported by the efforts to provide adequate urban green infrastructure and redevelopment of contaminated land and brownfield sites. Therefore, 147 numbers of ex-landfill sites located within the vicinity of urban area were urgently needed to be develop. Ex-landfill redevelopment should be considered as the planning component in creating a sustainable urban development for the benefits of mankind and the environment. Although there is a choice to select the type of development, the redevelopment of ex-landfill as public park should be considered as the most priority in accordance with the policies of the National physical development. Redevelopment of ex-landfill as a public park is not only able to contribute to the achievement of Malaysia as a Developed Country status through the achievement of open spaces standard 2 acres per 1,000 urban population but also will enhance the well-being of urban population as has been felt by the community surrounding the Worldwide Recreation Park.

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